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Systems Effectiveness Evaluation Program

The problem:

Reduce the man-hours needed to perform the routine monitoring and assessment of the effectiveness, reliability, and maintainability of large electronic equipment systems.

The solution:

The system of eight integrated computer programs provides the needed capability. The programs were originally developed to assess the reliability and maintainability of twelve sets of Acceptance Checkout Equipment/Spacecraft (AEC-S/C), each set containing 175 racks of equipment and 1,000,000 piece parts. These programs reduced requirements from five full-time personnel to one part-time person and provided a more comprehensive monthly assessment with automatic update of previous assessments.

How it's done:

The inputs to the System Effectiveness Evaluation (SEE) program consist of system configuration data, elapsed time meter readings, and edited failure reports.

The SEE program outputs are:

- (a) Mean-Times-Between-Failures (MTBF) and Mean-Times-To-Repair (MTTR) for all unique parts or assemblies, for all subsystems, and for the system, with associated confidence parameters and weak-link flags;
- (b) Printer-plotter trend charts of the MTBF's and MTTR's;
- (c) MTBF and MTTR correlation charts comparing the performance of all ground stations;
- (d) Computation of system reliability, availability, and expected cumulative downtime during a simulated mission; and

- (e) Numerous utility programs used in spares prediction and in the identification of problem areas.

An essential requirement is the proper and timely integration of data from three separate and distinct processes: the precise encoding of the complete logical description of all equipment; the encoding being performed with translation tables; the systematic reporting and processing of failure experiences; and the periodic recording and processing of equipment operating times.

The primary feature of the SEE program is the ability to rapidly pinpoint equipment problem areas for corrective action, down to the lowest possible level of assembly. The programs can be modified for any large complex electronic system.

Notes:

1. This program is written in FORTRAN (68%) and GMAP (32%) for use on the GE-635 computer.
2. Requests for further information may be directed to:

COSMIC
112 Barrow Hall
University of Georgia
Athens, Georgia 30601
Reference: HQN-10306

Source: H.P. Nicely, Jr., and W. D. Givens of
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